The Transformation of the Retail Industry by Digitization: Operating Models, Geography Pattern and Future Trends

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Abstract. Digitization is one of the current pivotal research topics. All industries are gradually undergoing transformation by leveraging digital technologies. Research approach on digital transformation process of retail sector includes: operating models, geography pattern and future trends. New outputs will be introduced in three innovative aspects of smart inventory system, AI prediction, IoT at consumer-end and cloud computing at retailer-end. Built on the research of consumers' demand, an overview of restructure of relationship between demand and supply is discussed. After stating how digitization alters the traditional agglomeration, the research focus on the persistence of physical clusters. The future trend of retail industry is highlighted and fully discussed. Research result shows that digital technology increases new outputs in aspects of selling and inventory, making both consumers and retailers more dominant to the market and product design. Therefore, digital technology balances the influence brought by geographical patterns by weakening some traditional geographical factors.

Keywords: Retail transformation, Digitization, AI

1. Introduction

Geology distribution always encourages or restricts the economic growth, due to its natural advantages or disadvantages. It can affect the efficiency, cost of production, and regional development. Enterprises have to face both external and internal factors that may cause impact on them in the market. While at certain times, the external factors caused by national policies or technology breakthrough may have severe repercussions to the entire market or even the whole industry.

Digitization is one of these most crucial external factors. In a broad sense, the process of digitization began with the widespread adoption of personal computers, database technologies, Internet commercialization. Mobile communication has driven the digitization of the total society. It causes huge shock to many industries or sectors inevitably, which includes the retailing industry. The digitization of the retail industry refers to the reconfiguration of the business model of the retail sector through digital technologies. Its essence lies in centering on data, optimizing efficiency and enhancing the customer experience. Each component of the retailing industry is forced to start digital transformation for the sake of seizing business opportunities in the constantly changing market. They all have to keep up with the times, and predict the changes in the future.

Digital technologies reshape the relationship of demand and supply. The related analyses on the impact of digital technologies on the geographical distribution and future development of the retail industry have been derived. Therefore, the research is mainly focusing on how digitization has managed to strike a balance with the original geographical location factors in the operations and future development of retailing sectors. A rough macro-level analysis of the impact of digital transformation on the entire retail industry in various aspects was conducted. This research analyzed the impacts brought about by digitization from three aspects: the consumer end, the dealer end, and the intermediate link that connects consumers and dealers. The purpose of this research is aimed to show the change in the new outputs of digital technology brought in management, entrepreneurship, marketing and logistics for retailers.

2. Manuscript preparation

Digital technology is changing the way the retail industry operates significantly, especially for consumers, retailers and the supporting system behind them.

2.1. Change on consumer-end

The emergence of artificial intelligence (AI) and internet of things (IoT) is one of the most significant inventions in digital age. AI assists personalized consumers experiences. AI and the IoT complement each other, enabling businesses to offer innovations to consumer-end. AI drives chat-bots to offer instantaneous customer support, sanctioning customers to browse product listings and coping queries in real time [1]. In addition to the interdependence of customers and sellers, IoT and AI can supplement each other as well. The behaviors of consumers recorded can be dissected by AI algorithms to prognosticate consumer inclination and future price settings [1]. This generate a mode called Small Batch & Quick Response, which is based on the initial order data, dynamically adjust production to achieve inventory overstock. Both operational efficiency and target services to clients are prompted

2.2. Change on retailer-end

With the help of technology, enterprises can achieve digitization easier than before through various tools. The key of connecting closely with consumers is using cloud computing to excavate data [2]. Physical stores are energized by the former IoT through setting sensors for retailers to track products and shelves apiece. Another famous tool is SaaS system. This is a service platform can provide software applications through the Internet. In this mode, users no longer need to purchase the entire foundation of the software, they only need to subscribe to gain access to the cloud software. For small and medium-sized enterprises (SMEs), the most advantage is the low cost of installation. They lack funds and IT resources to keep and maintain a traditional enterprise system with large costs [3]. This helps SMEs construct their online shop flexibly in a short period of time without fixed cost of renting house, therefore SMEs can focus on developing selling modes that fits themselves and outsourced payments and logistics.

2.3. Smart inventory system and logistic

The system connects consumers and retailers also progressed a lot. In the past, retailers were limited by location, high rent, fixed business hours and mainly relied on physical stores. This situation led to long-distance transportation or logistics stagnation caused by majeure, which would further result in

unpredictable shortages or backlogs of inventory. Sequentially, the total cost of production of enterprises would rise. Their profit might decrease in some extent as result. Nowadays, an increasing number of retailers are using AI prediction and Radio-Frequency Identification (RFID) to manage inventory in a smarter way. Stores or retailers use RFID have better productivity and efficiency, since it has the ability of machine-learning of quicker product coping. Thus, the proportion of common problems like product loss or out of stock happening can be greatly reduced. As this technology is developing into item-level tagging, each product will have its own code since they are manufactured in the shop floor. The transparency of supply-chain is greatly prompt by tracing the stages of production, transportation and selling [2]. It is assuredly a glad tiding for both retailers who operate business and bulk-buying products in multi-districts.

The innovation happens in technology aspect and marketing strategies. Fast fashion sector in retailing industry is a part that is newly-born in modern society. It has fundament of rapid speed and cheap prices which provides great convenience for target customers (generation Z or young women). Take famous brand of Shein for instance, it even forms a point scheme by providing their customers discounts through social medias and its online platforms. This enables consumers to check the complete price review [4]. This leads to a model called Consumers to Manufacturers (C2M). The main purpose of the mode is to prioritize the demand of consumers through cost-efficiency and non-homogenous goods [5]. Fees of logistics and immediate transportation are cut off, that is the reason why consumers are more sensible about the price. Shein immediately grabs Gen-Z through low-price and limitless choices for goods and services [4].

3. The impact of digital technology on interaction among participants

3.1. Restructure of relationship between consumers and producer

Digital technologies have turned consumers into the people who shape the brands and product decision. Consumers in the past tended to search for the products they wanted or needed by visiting and wandering in the physical retail stores, that process was somewhat blind. Nowadays, individuals who own a phone can easily carry out activities like searching on the Internet, downloading and making live-streaming. The relatively widespread of 4G and 5G wireless technology in the major districts of the world is the main reason. Customers did not concern themselves in the retail experience too much in the past, since they do not have the availability to seek for personalized and unique experience from retailers. Therefore, consumers have gained a certain degree of initiative in the current trade relationship. They can use their mobile phones to know more comprehensively about a product through disparate ways. These ways include chatting with the sales personnel and logging in the company's office websites. In this case, retailers or sellers find it is indispensable for them to be more active to meet with consumers' demand through the former mentioned channels.

With the help of emerging technologies in the first parts, the retail industry has realized that it needs to utilize every means and sales opportunity to meet consumers' psychological need for personalized shopping. In this way it can significantly increases their sales volume. Hence, me-retail gradually becomes a predominant trend in the industry. It provides individuals with thoroughly individualized shopping experiences, deploying statistics respecting browsing and purchasing conducts. Through the technologies and feedback systems introduced in second parts, consumers are no longer merely responding to supply. They are altering it in real time as well. In conclusion, the relationship between consumers and producers are becoming more dynamic and interdependent rather than still. It is interactive and data-driven, with both sides play central role in product development.

3.2. How technology affect the special distribution of retail industry

In any economic development process, geographical location factors play a significant role in the early and middle stages of the development. Initially, the majority of offline retailing stores are built in the busy downtown areas. Many of them are quite abutting due to the reliance on geographical proximity and high foot traffic of walk-in customers. Three rudimentary phases like requirement appearance, genuine business and consumption are epitomized by the classic consumption model, these phases seem to be disjunct [6]. However, the current situation has altered as cut-edge digital technology developing rapidly. In the digital age, it becomes unnecessary for retailers to occupy the propitious zones in the city center that requires high fixed costs of renting house. The three basic stages are shifting more closer in dimensions of time and space. Individuals go shopping as demand occurs and consume at the second of buying [6]. Enterprise like Amazon creates mode of virtual agglomeration, which enriches the extent and scope of the traditional industrial agglomeration. The website of Amazon draws millions of global sellers to sell online. It then forms digital business districts without boundaries through platform economy effect. The only effort that required for consumers is managing their phones in different apps. Another specimen is the Walmart, it ploughs massive funds on e-commerce initiatives. It judiciously amalgamates physical and digital channels through urging assistance of online grocery delivery and analyzing logistic managerial systems by data [1]. The borderline of real-meaning traditional retailing and e-commerce is obscured by those schemes and gradually goes to merger.

Nonetheless, geographical or physical factors still play a decisive function in some set of circumstances. After the agricultural modernization of China, typical retailer named Freshippo ('Hema' in Chinese pin in) providing high-quality fresh agricultural products based on orders appears and promotes the digital transformation of agricultural products [6]. Freshippo is a firm from Alibaba Group. and concentrates on fresh food retailing. Despite the digital technology can reduce the gap between western and eastern part of China to some extents, the majority of Freshippo villages are located at the main agricultural production regions [7]. It proves that the significance of innate geographical location advantages is unshakable. Digital technology can only balance the impacts of separate mixed factors and even prompt development of regions comparatively.

Another factor is place detachment. It is defined by the preceding studies of the definition of place attachment, which is a psychic connection between an individual and a peculiar location. It is usually based on factors of history, culture and social intercourse [8]. Place detachment of consumers can be intensively or unconsciously used by retailers to build the consumer loyalty. Although both online and offline shop can inspire the similar strong emotions of consumers, consumers are more willing to engage in out-spreading the affirmative word of mouth for the shop. They underpin the store despite they are restricted by the opening time and the location [8]. Some grocers are trying to get touch with customers by latest gig-delivery model with their geographical proximity in order to make consumers feel place detachment.

Additionally, there is trend of persistence of certain agglomeration hubs. The ParisÎledeFrance region is a global center of the luxury beauties and fragrances since the birth of the cosmetics industry. R&D centers and packaging business are locally anchored up to the present time. There are plenty of well-known universities, laboratories and parceling firms, it contains nine major R&D centers like L'Oréal, Chanel and Clarins. It holds over three thousand enterprises and provides 240000+ job opportunities directly or indirectly yearly [9]

4. The future trend of retail industry

The subscription model is in the first place, it is the derivative product of digitization. This model is continually advocated in the sectors of fast fashion and food. The variety of subscription products will be prompted by retailers in future to become more personalized with the help of AI. It is believed that the winners of competition in e-grocery are those retailers who can provide excellent and undeviating experience for their customers in a rapid way [10]. Take grocery sector of retailing for instance, it is demand-driven, since humanity will usually have feelings to buy or eat in a sudden. These kinds of feelings or behaviors are well-nigh incalculable. In this case, consumers expectations are formed by the supply itself through every single constitution of the experience [10]. An accomplishable subscription model can deliver awareness of exploitation and inspiration. It may mean the most seamless click-collect impression, which has another name of omni-channel shopping. Many retailers spend their whole life on how to attract their guests through the only media —shop, while knowing how the critical customers want to get in touch with them is the necessity currently [11]. It is completely a different skill form the former one.

The anticipation of consumers' shifting between offline stores, virtual shops and their mobile terminals is reflected by the conceptualization of omni-channel retailing [1]. An enhanced and advanced shopping experience is fostered through the multi-channels of engagement between consumers and sellers. Sellers can continuingly heighten the wandering of customers with the development of digital technologies, including tools of augment reality (AR) and virtual reality (VR). Consumers are aspiring for shopping experiences that are both fluxional (uninterruptedly shifting between medias without encountering frictions) and cohesive (the consistent core of branding, services and product in omni-channels). Meanwhile data security has become the most concerned problem in current age, since retailers are utilizing enormous amount of consumers' data to improve the browsing experience. This can inevitably lead to situations of data breaches and privacy violations.

Unauthorized access to the search engine of brands can lead to data beaches, affecting both privacy of individuals and enterprises [12]. Hence, transpicuous and steady execution of data management should be accepted by retailers in order to perpetuate trust form consumers. The equilibrium of privateness and personalization is becoming more and more indispensable, which coerces retailers to set the security level of the database at the top priority. Governments should impose evolving legislation to complete the regulatory system for data hoard and digital security.

In addition, the convergence of purchasing behaviors in varying countries or districts may be different due to the uneven globalization processes. This will cause diverse in purchasing power and consumer confidence in separate zones, leading to variation in sales of production. Retailers are required to have a distinct long-term macro planning of the economics trend of the district they are at currently. More intense market power and better predictive activities are required for firms to improve their competitiveness in the market.

5. Conclusion

The research discusses the impact and extent of digitization on retailing industry through the aspects of new output appearance, restructure of relationship between consumers and producers, and effect of technology on the spatial distribution. The research shows digitization can only achieve a certain degree of balance with the original geographical location factors from the perspective of the development. Digital technology increases new outputs in aspects of selling and inventory, making both consumers and retailers more dominant to the market and product design. Geographical factors

are still the core of retailing industry. Even the changes that brought to the industry by new technology is significant in the latest decades, it can only make a limited extent of effect. Another focusing point is about delivery services of grocery retailers with geographical proximity. Research result shows that digital technology balances the influence brought by geographical patterns by weakening some traditional geographical factors. Theoretical or practical further study about two aspects will be necessary in the future. One is whether the third-parties providing delivery services will maintain the safety-level of food to keep positive for grocers. The other is how on-line retailers can utilize the place attachment connection of consumers to increase its sales and providing better shopping experience at the same time. Examining the specific digital transformation strategies or outcomes of each sector in the retail industry is somewhat too fragmented and cannot be covered in the article. Hence, a model that analyzing how different niche geographical factors can impact sectors other than grocery and fast fashion in required. Empirical research to strengthen the conceptual framework is necessary in the future.

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